Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A system for conveying a well apparatus in a well, comprising:

a composite tube having a liner with a flow bore to circulate fluids in the well and fibers engineered to cause said composite tube to withstand axial and yield stresses placed on said composite tube~~wrapped in a predetermined pattern around said liner to carry axial load~~;

~~said composite tube having a modulus which does not vary along the length of the composite tube;~~

a conductor disposed in a wall of the composite tube; and

a propulsion system attached downhole to said composite tube and to the well apparatus, said propulsion system being powered by the fluids circulating through said composite tube to propel the well apparatus within the well.

2. (Previously presented) The system of claim 1 wherein said fluids around said composite tube cause said composite tube to achieve substantially neutral buoyancy within the well.

3. (Previously presented) The system of claim 1 wherein said composite tube includes an axial component of the modulus of elasticity having Young's modulus in the range of 500,000 to 10,500,000 psi.

4-6. (Canceled)

7. (Previously presented) The system of claim 1 wherein said composite tube has a material with a density in the range of from 0.99 grams per cubic centimeter to 2.9 grams per cubic centimeter achieving substantially neutral buoyancy in said fluids.

8. (Canceled)

9. (Canceled)

10. (Currently amended) The system of claim 1 wherein said composite tube is made of a fiber reinforced matrix forming a modulus which is non-linear~~does not vary along the length of the composite tube~~.

11. (Previously presented) The system of claim 1 wherein said conductor is an electrical power conductor embedded non-axially in said composite tube.

12. (Previously presented) The system of claim 1 further including an electrical conductor and a data transmission conductor housed adjacent said fibers of said composite tube.

13. (Previously presented) The system of claim 1 further including passages for conveying fluid pressure and conductors for conducting electricity and data, said passages and conductors being disposed adjacent said fibers.

14. (Canceled)

15. (Previously presented) The system of claim 1 wherein said propulsion system includes an aperture therethrough extending around an axis of the propulsion system and from an upstream end to a downstream end for the flow of fluid through said propulsion system.

16. (Canceled)

17. (Currently amended) An apparatus for performing operations downhole in a well comprising:

a string of tubular members each having a liner with a flow bore to circulate fluids with fibers forming a composite tube engineered to cause said composite tube to

withstand axial and yield stresses placed on said composite tube~~wrapped in a predetermined pattern around said liner to carry axial load~~, said fibers forming a wall of non-metallic fibers having an axial component of modulus of elasticity greater than 500,000 psi;

a bottom hole assembly attached downhole to said string;

said bottom hole assembly including a propulsion system to propel said bottom hole assembly in the well, said propulsion system being powered by the fluids circulating through said composite tube to propel the bottom hole assembly within the well; and

a power conductor disposed adjacent said fibers in said wall and spirally wound around said liner providing power to said bottom hole assembly.

18. (Previously presented) The apparatus of claim 17 wherein said bottom hole assembly includes a non-drilling well apparatus.

19. (Canceled)

20. (Previously presented) The apparatus of claim 17 wherein said bottom hole assembly includes a bit connected to a three dimensional steering apparatus by an articulated joint to change a bend angle and angular orientation of the bend angle of said bit at said articulated joint.

21. (Currently amended) A drilling system for drilling into a formation comprising:

a string of pipe having a portion thereof which is non-metallic with fibers wrapped [in a predetermined pattern] about a conduit adapted for the flow of fluids, said fibers being engineered to cause said non-metallic portion to withstand axial and yield stresses placed on said non-metallic portion;

a bottom hole assembly attached to one end of the string and having a propulsion system and a member for displacing formation;

said bottom hole assembly having a flow passage therethrough adapted for the flow of fluids and a return passageway external of said bottom hole assembly adapted for the flow of fluids containing cuttings;

said propulsion system adapted to propel said bottom hole assembly in the well, said propulsion system being powered by the fluids circulating through said conduit and bottom hole assembly to propel the bottom hole assembly within the well; and

a power conductor disposed adjacent said fibers providing power to said bottom hole assembly.

22. (Previously presented) The system of claim 21 wherein said wrapped fibers form composite tubes and further including a connector for connecting lengths of said composite tubes.

23. (Previously presented) The system of claim 21 further including a steerable assembly having an actuator to adjust a bend angle between said formation displacing member and said bottom hole assembly and to adjust an angular orientation of the bend angle to alter the direction of the well path of said bottom hole assembly.

24. (Currently amended) The system of claim 21 further including a power section ~~and propulsion system~~ driven by the circulating fluids and providing power to said bottom hole assembly.

25. (Currently amended) The system of claim 21 wherein said ~~composite tube~~ non-metallic portion has load-carrying layers of fiber engineered to provide tensile strength to said string~~, said layers forming a modulus which does not vary along the length of the composite tube~~.

26-32 (Canceled)

33. (Previously presented) A system for drilling a borehole, comprising:

a string of composite pipe extending into the borehole, said composite pipe including fibers wrapped in a predetermined pattern to carry axial load;

a prime mover coupled to said pipe string;

a drill bit at one end for drilling the borehole;

said drill bit engaged to said prime mover;

a steerable assembly connected to said prime mover; and

said prime mover pulling said composite pipe and forcing said drill bit downstream within the borehole.

34. (Previously presented) A bottom hole assembly for controlling the drilling of a borehole from a control at the surface, comprising:

a composite pipe extending into the borehole;

said composite pipe having a data transmission conduit coupled to the control;

a prime mover coupled to said pipe;

a downhole motor for rotating an output shaft having an articulation joint allowing said output shaft to have a bend angle and an angular orientation of said bend angle, said output shaft operatively extending through a steerable assembly to rotate a drill bit;

said steerable assembly sending signals through said data transmission conduit to the control and said steerable assembly receiving signals from the control;

said steerable assembly having an actuator to adjust the bend angle and the angular orientation of the bend angle of the output shaft to direct said drill bit three dimensionally without rotation of said prime mover;

said prime mover adapted to move said drill bit upstream or downstream within the borehole in response to said signals received by said steerable assembly.

35. (Previously presented) A bottom hole assembly for use in drilling a borehole, comprising:

a pipe attached at one end to the bottom hole assembly and having a communication link disposed within a wall of the pipe;

a downhole motor;

a drill bit;

a propulsion system;

an articulated joint forming a bend angle and an angular orientation of said bend angle and having a first portion connected to said downhole motor and a second portion coupled to said drill bit, said second portion connected to said first portion in a manner to permit said second portion to form said bend angle and said angular orientation; and

a steerable assembly in engagement with said second portion, said steerable assembly being in communication with said communication link to adjust said bend angle and said angular orientation of said bend angle to alter said second portion three dimensionally with respect to said first portion upon command to change the direction of said drill bit.

36. (Canceled)

37. (Canceled)

38. (Previously presented) A system for conveying a well apparatus in a well, comprising:

a string of composite tubes with one or more conductors disposed in a wall thereof and a flow bore to circulate fluids downhole in the well;

a propulsion system attached downhole to said string; said propulsion system being powered by the circulation fluids circulated through said flow bore and up an annulus formed by the composite tubes;

said propulsion system applying a downstream force on said string pulling said string downhole; and

said composite tubes having layers of fibers engineered to cause said composite tubes to withstand axial and yield stress placed on said string.

39. (Previously presented) The system of claim 38 further including a power section providing power to a drill member utilizing the circulation fluids.

40. (Previously presented) The system of claim 39 wherein said propulsion system and power section are powered by the circulation fluids supplied through said string.

41. (Previously presented) The system of claim 38 wherein said composite tubes have a material with a density in the range of from 0.99 grams per cubic centimeter to 2.9 grams per cubic centimeter.

42. (Previously presented) The system of claim 38 wherein said composite tubes are made of a fiber reinforced matrix.

43. (Previously presented) The system of claim 38 further including a connector for connecting lengths of said composite tubes.

44. (Previously presented) The system of claim 38 further including a three dimensional steering apparatus having a universal joint and an actuator for adjusting a bend angle and angular orientation of said bend angle of said universal joint.

45. (Previously presented) The system of claim 38 further including a drill member and a steerable assembly adjusting a bend angle and angular orientation of said bend angle between said drill member and steerable assembly for controlling the direction of said drill member.

46. (Previously presented) The system of claim 38 further including:

a drill bit connected to a downhole motor by an articulated joint, said articulated joint having a first portion connected to said downhole motor and a second portion coupled to said drill bit, said second portion connected to said first portion in a manner to permit said second portion to have a bend angle and an angular orientation of said bend angle with respect to said first portion; and

a steerable assembly in engagement with said second portion, said steerable assembly being in communication with said communication link to alter said bend angle and said angular orientation of said second portion with respect to said first portion upon command to change the direction and/or angle of inclination of said drill bit.

47. (Previously presented) The system of claim 35 wherein said steerable assembly includes at least one electrically actuated motor to cause said second portion to move three dimensionally.

48. (Previously presented) The system of claim 1 wherein said composite tube includes load carrying layers of fibers and a wear layer disposed around said load carrying layers.

49. (Previously presented) The system of claim 48 wherein said wear layer is braided around said load carrying layers.

50. (Previously presented) The system of claim 48 further including a pressure layer around said load carrying layers.

51. (Previously presented) The system of claim 1 wherein said propulsion system is powered by the fluids circulated through said flow bore and up an annulus formed by the composite tube.

52. (Previously presented) The system of claim 1 wherein said propulsion system includes a housing with traction modules for alternating engaging the borehole to propel a bit for drilling a borehole in the well.

53. (Previously presented) The apparatus of claim 17 wherein said bottom hole assembly includes an electronics section and a propulsion system having a resistivity antenna, said resistivity antenna being connected to said electronics section for measuring the resistivity of the well.

54. (Previously presented) The apparatus of claim 17 wherein fibers are engineered to cause said string to achieve substantially neutral buoyancy in the fluids in the well.

55. (Previously presented) The apparatus of claim 19 wherein said propulsion system is powered by circulation fluids passing through said string and bottom hole assembly.

56. (Previously presented) The apparatus of claim 20 wherein said three dimensional steering apparatus includes a three dimensionally, angularly adjustable joint at said three dimensional steering apparatus.

57. (Previously presented) The drilling system of claim 21 wherein said bottom hole assembly has an axis with a central flow passage therethrough disposed about said axis.

58. (Previously presented) The apparatus of claim 53 wherein said propulsion system includes a housing with an aperture receiving said resistivity antenna.

59. (Previously presented) The drilling system of claim 22 wherein said connector includes:

a first end connector mounted on one composite tube;

a second end connector mounted on a second composite tube;

said end connectors having mating cooperative surfaces which engage upon mating said end connectors; and

seals sealingly engaging upon the mating of said cooperative surfaces to provide a hydraulic seal around said power conductor.

60. (Currently amended) The drill system of claim 22 further including:

first and second lengths of a composite tube, each length including an inner liner, a plurality of load carrying layers around said liner, at least one power conductor and at least one data transmission conductor extending said length between said load carrying layers;

first and second end connectors for disposition on said first and second lengths respectively, said end connectors having apertures for receiving one end of said liners, load carrying layers, power conductor and data transmission conductor;

said end connectors having conductor connectors for connecting said power conductors and said data transmission conductors; [[and]]

said end connectors having interengageable members connecting said end connectors; and

said end connectors having interengageable members connecting said end connectors; and

seals sealingly engaging upon the mating of said cooperative surfaces to provide a hydraulic seal around said power conductor.

61. (Previously presented) The system of claim 23 wherein said steerable assembly is actuated electrically.

62. (Previously presented) The apparatus of claim 23 wherein said steerable assembly includes a housing, a plurality of spacer members disposed in apertures azimuthally spaced around said housing, and a plurality of actuators mounted in said housing for individually actuating said spacer members into engagement with the borehole at different radial extents.

63. (Canceled)

64. (Previously presented) An apparatus for performing operations downhole in a well comprising:

a string of tubular members each having a liner with a flow bore to circulate fluids with fibers wrapped in a predetermined pattern around said liner to carry axial load, said fibers forming a wall of non-metallic fibers having an axial component of modulus of elasticity greater than 500,000 psi;

a bottom hole assembly attached downhole to said string;

a power conductor disposed adjacent said fibers in said wall and spirally wound around said liner providing power to said bottom hole assembly; and

said wall having a modulus of elasticity which is not linear and has a yield strain which allows said wall to withstand loads placed on said string of tubular members.

65. (Previously presented) An apparatus for performing operations downhole in a well comprising:

a string of tubular members each having a liner with a flow bore to circulate fluids with fibers wrapped in a predetermined pattern around said liner to carry axial load, said fibers forming a wall of non-metallic fibers having an axial component of modulus of elasticity greater than 500,000 psi;

a bottom hole assembly attached downhole to said string;

a power conductor disposed adjacent said fibers in said wall and spirally wound around said liner providing power to said bottom hole assembly; and

said wall having a yield strain which allows said tubular members sufficient bending to be spooled onto a spool; and said wall having a modulus of elasticity which is not the same in all axes.

66. (Previously presented) The apparatus of claim 65 wherein said yield strain is at least 0.01818.

67. (Currently amended) The apparatus of claim 65 wherein said wall has a modulus of elasticity in an axial direction and a yield stress, ~~said~~ a yield strain being a ratio of said yield stress to said modulus of elasticity.

68. (Currently amended) The apparatus of claim 17 wherein said modulus of elasticity in the axial direction is in the range of 0.5 to 10.5 million psi and is not linear~~does not vary along the length of the string~~.

69. (Previously presented) The apparatus of claim 17 wherein said modulus of elasticity in an axial direction is determined by dividing the yield strain into the yield stress required for said composite tube to be engineered for a particular well.

70. (Previously presented) The apparatus of claim 17 wherein said modulus of elasticity in an axial direction is at least 1.43 million psi.

71. (Previously presented) The apparatus of claim 67 wherein said yield stress is at least 26,000 psi.

72. (Previously presented) The apparatus of claim 17 wherein said wall has a yield strain, modulus of elasticity in an axial direction, and a yield stress, said modulus of elasticity in the axial direction being determined by dividing the yield strain into the yield stress required for said wall to be spoolable.

73. (Previously presented) The apparatus of claim 17 wherein said tubular members have a density substantially the same as that of the wellbore fluids.

74. (Previously presented) The apparatus of claim 73 for drilling a wellbore using drilling fluids having a specific gravity between 8.4 and 12.5 pounds per gallon, further including a propulsion system attached downhole to said string applying a pull force on said string between zero and 14,000 pounds depending upon the specific gravity of the drilling fluids.